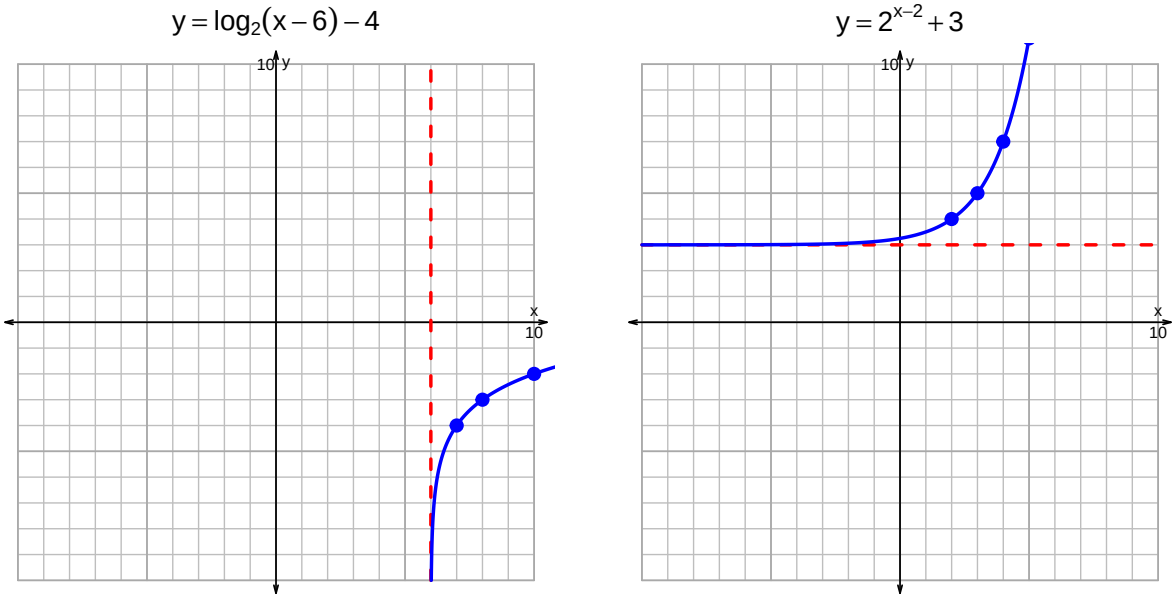
Name: Date:

s18: EXP LOG (SLTN v319)

1. (10 pts) Graph $y = \log_2(x-6) - 4$ and $y = 2^{x-2} + 3$ on the grids below. Also, draw any asymptotes with dashed lines.



Somewhat useful hint: $2^3 = 8$, *and thus* $\log_2(8) = 3$.

2. (10 pts) Write (but do not evaluate) the solution to the equation below by writing a logarithmic expression. Please do not do any arithmetic; just move numbers around.

$$-29 = \left(\frac{-4}{7}\right) \cdot 2^{-5t/3}$$

Divide both sides by $\frac{-4}{7}$.

$$\frac{29 \cdot 7}{4} = 2^{-5t/3}$$

Take log, base 2, of both sides.

$$\log_2\left(\frac{29 \cdot 7}{4}\right) = \frac{-5t}{3}$$

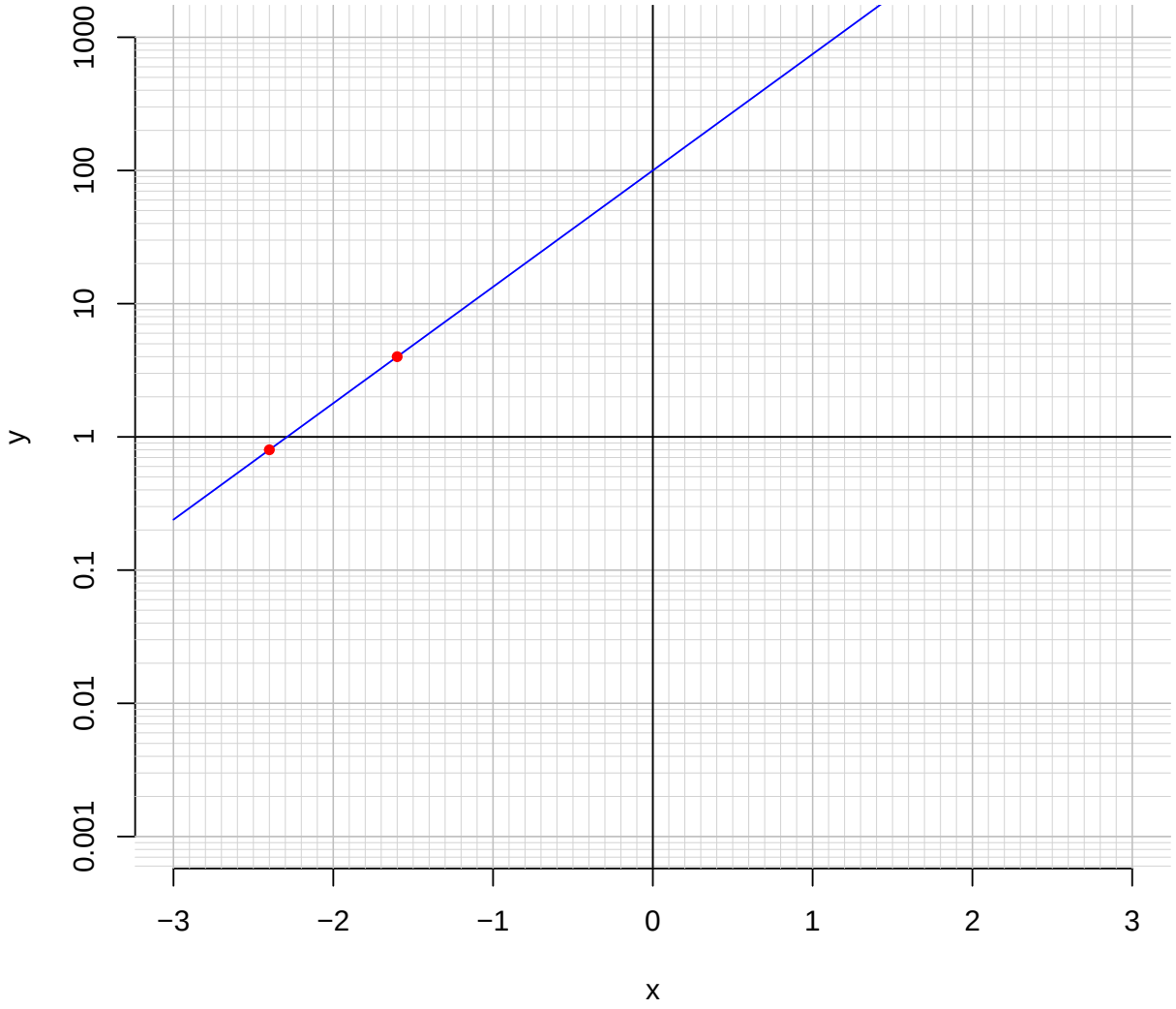
Divide both sides by $\frac{-5}{3}$.

$$\frac{-3}{5} \cdot \log_2\left(\frac{29 \cdot 7}{4}\right) = t$$

Switch sides.

$$t = \frac{-3}{5} \cdot \log_2\left(\frac{29 \cdot 7}{4}\right)$$

3. (10 pts) An exponential function $f(x) = 100 \cdot e^{2.01x}$ is graphed below on a semi-log plot.



a. Using the plot above, evaluate $f(-2.4)$.

$$f(-2.4) = 0.8$$

b. The inverse function is logarithmic.

$$f^{-1}(x) = \frac{1}{2.01} \cdot \ln\left(\frac{x}{100}\right)$$

Using the plot above, evaluate $f^{-1}(4)$.

$$f^{-1}(4) = -1.6$$